

Gerallyn Duke



**Monroe Energy, LLC**  
4101 Post Road  
Trainer, PA 19061  
(610) 364-8000

April 25, 2016

FEDEX# 7761 8526 1870

**RECEIVED**

APR 26 2016

Ms. Gerallyn Duke  
Office of Permits & State Programs  
U.S. EPA Region 3  
Mail Code: 3AP10  
1650 Arch Street  
Philadelphia, PA 19103

Air Protection Division

Subject: Response to 4/11/2016 Meeting Regarding the Plan Approval Application for  
Ultra Low Sulfur Gasoline Project

Dear Ms. Duke:

Monroe Energy, LLC's Trainer Refinery (the "Refinery") is submitting this letter and its attachments in response to the April 11, 2016 meeting with the Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (PADEP) to discuss the Refinery's proposed Ultra Low Sulfur Gasoline Project.

Should you have any questions or require additional information, please contact me at 610-363-8399.

Sincerely,

A handwritten signature in blue ink, appearing to read "Matthew Torell".

Matthew Torell, P.E.  
Environmental Leader

Attachments

Ms. Gerallyn Duke  
4/25/2016

cc: Mr. James Beach  
Environmental Engineer Manager  
Pennsylvania Department of Environmental Quality  
2 East Main Street  
Norristown, PA 19401  
**FedEx# 7761 8259 1976**

**Attachment A:**  
**Monroe Energy's Response to April 11, 2016 Meeting**

Monroe Energy, LLC's Trainer Refinery (the "Refinery") is planning to install a new Ultra Low Sulfur Gasoline (ULSG) unit to comply with EPA's Tier 3 Motor Vehicle Emission and Fuel Standard, which requires the Refinery meet a 10 ppm standard of sulfur in gasoline by January 1, 2017.

On September 14, 2015, the Refinery submitted a Plan Approval Application for the ULSG Project to the Pennsylvania Department of Environmental Protection (PADEP). Refinery and PADEP personnel have met on multiple occasions to discuss the application. The most recent meeting occurred April 11, 2016, which also included EPA Region 3 personnel Ms. Gerallyn Duke and Mr. David Campbell.

Since the meeting on April 11, the Refinery has carefully considered EPA's comments, and based on the discussions of 4/11/2016, analyzed the previously submitted Plan Approval Application and determined that the proposed project was not clearly defined or explained. In addition, in consideration of EPA guidance, the Refinery has concluded that some of the calculations presented in the emissions inventory tables were not performed in accordance with the Prevention of Significant Deterioration (PSD) regulations cited at 40 CFR 52.21 and adopted in entirety at Subchapter D of Chapter 127 of the state air regulations, along with PSD guidance documents that guide project emission increase analyses. Other calculations were determined to have minor calculation errors and are corrected as a part of this Plan Approval Application Addendum.

As a result of these deficiencies, the Refinery is proposing the following edits to the September application:

- Clarification of the project description
- Revision of the Emission Inventory tables

### **Project Description**

We believe that the Plan Approval Application can better be understood as two projects at the refinery, both involving the ULSG Unit.

1. ULSG Construction Project
2. Crude Rate Increase Project

Each of the projects is discussed below.

#### **1. ULSG Construction Project**

The Refinery is proposing to install a new ULSG unit to desulfurize gasoline-blending intermediates from 30 ppm sulfur to 10 ppm sulfur. Feed for the new ULSG unit will be comprised of existing unit outputs, comprised of 34,000 BPD of Naphtha from the FCC and

8,500 BPD of Light Straight Run (LSR) Naphtha from the Crude Units. As a part of this project, two new feed heaters, a cooling tower, and unit fugitives will be installed. In addition, the project affected sources are the:

- Sulfur Plant (Source ID 102), as sulfur production will increase by 2.39 LTPD; and
- Boilers 9 and 10 (Source IDs 34 and 35, as steam usage will increase by 5,602 lb/hr);

Using a conservative approach, the Refinery has also included the Main Flare (Source ID 103) as an affected source with an incremental increase in emissions, as new connections will be made to the Main Flare; however, the Refinery operates a Flare Gas Recovery Unit and does not expect additional emissions under normal operation from the Main Flare as a result of the new ULSG.

Emissions from the new sources are calculated on a Potential-to-Emit (PTE) basis. Affected sources are calculated based on the Projected Actual Emissions (PAE) minus the Baseline Actual Emissions (BAE), without the use of the “could have accommodated” (CHA) or excluded emissions. This revision is to incorporate EPA and PADEP’s feedback regarding the application as it relates to the ULSG portion of the project. The PAE rates reflect the increased utilization of the affected sources as a result of the ULSG unit demand as projected for the 10 years following project installation. BAE are based on the average rate, in tons per year, of any historic 24 consecutive month period during the 10 years prior to submission of a completed plan approval application for PSD and 5 years for Nonattainment New Source Review (NNSR).

## **2. Crude Rate Increase Project**

Based on market demand and economics, the Refinery is proposing to increase crude oil throughput by up to 5,000 BPD on a short term basis, which has been annualized for emission calculations. There will be no changes to the affected units that would meet the definition of a physical change or a change in the method of operation. In addition, historical rates at the Refinery show the ability to meet this level of demand.

Emissions from the affected sources are calculated based on the Projected Actual Emissions (PAE) minus the Baseline Actual Emissions (BAE) and “Could Have Accommodated Emissions” (CHA). The PAE rates reflect the increased utilization of the affected sources as a result of the crude throughput increase. BAE are based on the average rate, in tons per year, of any historic 24 consecutive month period during the 10 years prior to submission of a completed plan approval application for PSD and 5 years for NNSR. CHA rates are calculated by annualizing the highest monthly emissions for each affected unit and pollutant within the selected baseline period for that pollutant.

## **Emissions Inventory Table Changes**

In the September 2015 Plan Approval Application, the Refinery incorrectly applied CHA to the sources (Boilers 9, 10, SRU, and Flare) affected by the construction of the new unit, as these

sources emissions increased as a result of the demand required by the ULSG unit. As a result, the revised project emissions changes increased for those sources when compared to the September application. It was also discovered that PAE for Boilers 9 and 10 were overestimated, as the steam demand required by the project was calculated incorrectly in the September application (18,900 lb/hr vs. 5,800 lb/hr for both the ULSG and the Crude Rate Increase Project on an annual basis). This error has also been corrected. This revised tables are presented in Attachment 2.

Note that the exclusion of the CHA for the ULSG Construction Project affected sources has resulted in the need for the Refinery to purchase one (1) additional NOx credit, as the calculation shows that 49 credits are now required vs. 48 credits required in the September application.

**Attachment B:**  
**Revised Emission Inventory Tables from “Attachment C” in Plan Approval**  
**Application**

**Table C-1**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**PSD Baseline Actual Emission Rates**

Emission Unit	Emission Rate (tpy)									
	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NOx	VOC	CO	Lead	H <sub>2</sub> S	CO <sub>2</sub> e <sup>(a)</sup>
<b>ULSG and Crude Throughput Affected Sources</b>										
34	Boiler 9	0.53	1.69	1.51	1.93	4.14	0.11	1.17	4.51E-04	0.06
35	Boiler 10	0.38	1.06	1.01	1.91	3.89	0.10	8.72	4.32E-04	0.06
102	SRU	0.10	0.38	0.38	19.27	5.22	0.24	3.56	2.04E-05	0.00
103	Main Flare	4.05	5.04	5.04	10.04	10.19	33.12	58.11	1.14E-04	14.23
<b>Crude Throughput Project Affected Sources</b>										
101	FCCU Unit	43.06	63.93	56.61	46.18	297.01	3.18	15.63	2.47E-04	-
733	FCCU Feed Heater	0.10	0.42	0.42	0.44	1.76	0.30	0.93	3.73E-05	0.01
735	Kerosene/HCN HTU Feed Heater	0.22	0.36	0.36	0.39	6.41	0.26	3.23	1.82E-05	2.74E-03
736	Diesel HTU Heater	0.24	0.42	0.42	0.49	10.39	0.06	3.49	3.35E-05	0.01
741	D2/VGO Hydrotreater Feed Heater	0.43	0.33	0.33	0.64	8.01	0.44	7.44	4.78E-05	0.01
737	Naphtha HDS Heater	1.19	1.87	1.87	1.96	26.07	1.35	20.86	1.22E-04	0.02
738	Platformer Feed Heater	8.45	13.44	13.44	14.10	147.14	9.73	1.57	9.42E-04	0.19
739	Isocracker 1st Stage Heater	0.55	0.96	0.96	1.01	15.65	0.70	11.21	6.49E-05	0.01
740	Isocracker Splitter Reboiler	0.69	1.19	1.19	1.25	15.70	0.86	13.38	7.83E-05	0.01
742	VCD 541 VAC Heater	0.18	0.71	0.71	0.77	13.38	0.51	7.34	4.31E-05	0.01
743	VCD 542 VAC Heater	0.44	0.78	0.78	0.44	4.48	0.02	0.01	2.38E-05	0.01
746	VCD 544 VAC Heater	1.35	2.88	2.88	2.37	12.53	2.19	1.34	1.40E-04	0.02
744	ACD 543 Crude Heater	4.32	7.22	7.22	7.89	28.30	5.23	81.32	4.82E-04	0.09
745	ACD 544 Crude Heater	4.68	7.59	7.59	8.29	32.82	5.49	83.63	4.91E-04	0.09
165	Tank 93	-	-	-	-	2.46	-	-	-	-
166	Tank 94	-	-	-	-	1.61	-	-	-	-
126	Tank 95	-	-	-	-	2.13	-	-	-	-
127	Tank 96	-	-	-	-	3.27	-	-	-	-
137	Tank 152	-	-	-	-	1.38	-	-	-	-
138	Tank 153	-	-	-	-	0.15	-	-	-	-
140	Tank 155	-	-	-	-	0.13	-	-	-	-
142	Tank 157	-	-	-	-	0.15	-	-	-	-
300	Tank 158 (Source ID 193)	-	-	-	-	3.50	-	-	-	-
143	Tank 159	-	-	-	-	3.32	-	-	-	-
194	Tank 160	-	-	-	-	4.86	-	-	-	-
144	Tank 161	-	-	-	-	2.70	-	-	-	-
145	Tank 162	-	-	-	-	0.87	-	-	-	-
146	Tank 163	-	-	-	-	1.60	-	-	-	-
147	Tank 164	-	-	-	-	2.53	-	-	-	-
148	Tank 165	-	-	-	-	3.09	-	-	-	-
149	Tank 166	-	-	-	-	2.16	-	-	-	-
150	Tank 168	-	-	-	-	1.53	-	-	-	-
152	Tank 170	-	-	-	-	3.02	-	-	-	-
155	Tank 174	-	-	-	-	4.09	-	-	-	-
156	Tank 175	-	-	-	-	5.35	-	-	-	-
157	Tank 178	-	-	-	-	4.53	-	-	-	-
160	Tank 181	-	-	-	-	3.03	-	-	-	-
161	Tank 182	-	-	-	-	6.52	-	-	-	-
163	Tank 185	-	-	-	-	7.02	-	-	-	-
164	Tank 186	-	-	-	-	4.75	-	-	-	-
<i>Total Baseline Emissions (tons/24 months)</i>		141.92	220.54	205.42	238.75	1,286.16	279.26	645.90	7.58E-03	29.70
<i>Total Baseline Actual Emissions</i>		70.96	110.27	102.71	119.38	643.08	139.63	322.95	3.79E-03	14.85
<i>Baseline Period</i>		Aug-13	Aug-13	Aug-13	Aug-13	Aug-13	Aug-13	Jan-13	Nov-12	Jan-09
		Jul-15	Jul-15	Jul-15	Jul-15	Jul-15	Jul-15	Dec-14	Oct-14	Jun-09
								Dec-14	Oct-14	May-11

<sup>(a)</sup> CO<sub>2</sub>e is carbon dioxide equivalent, calculated according to 40 CFR 98 Equation A-1:

$$CO_2e = \sum_{i=1}^n GHG_i \times GWP_i$$

where GHG<sub>i</sub> = annual mass emissions of greenhouse gas i (short tons/year)

GWP<sub>i</sub> = global warming potential of greenhouse gas i from the table below

Pollutant	GWP (100 year)
CO <sub>2</sub>	1
N <sub>2</sub> O	298
CH <sub>4</sub>	25

*new (higher)  
baseline  
periods*

**Table C-2**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**NNSR Baseline Actual Emission Rates**

Emission Unit	Emission Rate (tpy)				
	PM <sub>2.5</sub> NNSR			Ozone NNSR	
	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	NO <sub>x</sub>	VOC
<b>ULSG Affected Sources</b>					
34	Boiler 9	1.51	1.93	4.14	4.14
35	Boiler 10	1.01	1.91	3.89	3.89
102	SRU	0.38	19.27	5.22	5.22
103	Main Flare	5.04	10.04	10.19	10.19
<b>Crude Throughput Project Affected Sources</b>					
101	FCC Unit	56.61	46.18	297.01	297.01
733	FCCU Feed Heater	0.42	0.44	1.76	1.76
735	Kerosene/HCN HTU Feed Heater	0.36	0.39	6.41	6.41
736	Diesel HTU Heater	0.42	0.49	10.39	10.39
741	D2/VGO Hydrotreater Feed Heater	0.33	0.64	8.01	8.01
737	Naphtha HDS Heater	1.87	1.96	26.07	26.07
738	Platformer Feed Heater	13.44	14.10	147.14	147.14
739	Isocracker 1st Stage Heater	0.96	1.01	15.65	15.65
740	Isocracker Splitter Reboiler	1.19	1.25	15.70	15.70
742	VCD 541 VAC Heater	0.71	0.77	13.38	13.38
743	VCD 542 VAC Heater	0.78	0.44	4.48	4.48
746	VCD 544 VAC Heater	2.88	2.37	12.53	12.53
744	ACD 543 Crude Heater	7.22	7.89	28.30	28.30
745	ACD 544 Crude Heater	7.59	8.29	32.82	32.82
165	Tank 93	-	-	-	2.46
166	Tank 94	-	-	-	1.61
126	Tank 95	-	-	-	2.13
127	Tank 96	-	-	-	3.27
137	Tank 152	-	-	-	1.38
138	Tank 153	-	-	-	0.15
140	Tank 155	-	-	-	0.13
142	Tank 157	-	-	-	0.15
300	Tank 158 (Source ID 193)	-	-	-	3.50
143	Tank 159	-	-	-	3.32
194	Tank 160	-	-	-	4.86
144	Tank 161	-	-	-	2.70
145	Tank 162	-	-	-	0.87
146	Tank 163	-	-	-	1.60
147	Tank 164	-	-	-	2.53
148	Tank 165	-	-	-	3.09
149	Tank 166	-	-	-	2.16
150	Tank 168	-	-	-	1.53
152	Tank 170	-	-	-	3.02
155	Tank 174	-	-	-	4.09
156	Tank 175	-	-	-	5.35
157	Tank 178	-	-	-	4.53
160	Tank 181	-	-	-	3.03
161	Tank 182	-	-	-	6.52
163	Tank 185	-	-	-	7.02
164	Tank 186	-	-	-	4.75
<b>Total Baseline Emissions (tons/24 months)</b>		205.42	238.75	1,286.16	1,286.16
<b>Total Baseline Actual Emissions</b>		102.71	119.38	643.08	643.08
<b>Baseline Period</b>		Aug-13	Aug-13	Aug-13	Aug-13
		Jul-15	Jul-15	Jul-15	Jul-15

**Table C-3**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Projected Future Operations**

Emission Unit	Projected Heat Duty <sup>(a)</sup>		Projected Annual Hours of Operation
	MMBtu/hr	MMBtu/yr	
<b>ULSG Affected and New Sources</b>			
34	Boiler 9	-	-
35	Boiler 10	-	-
102	SRU	-	-
103	Main Flare	-	-
-	Feed Heater 1	99.6	872,496
-	Feed Heater 2	44.2	387,192
-	Cooling Tower	-	-
-	Fugitives	-	-
<b>Crude Throughput Project Affected Sources</b>			
34	Boiler 9	-	-
35	Boiler 10	-	-
102	SRU	-	-
103	Main Flare	-	-
101	FCC Unit <sup>(b)</sup>	-	-
733	FCCU Feed Heater	23	201,480
735	Kerosene/HCN HTU Feed Heater	8.3	72,708
736	Diesel HTU Heater	20	175,200
741	D2/VGO Hydrotreater Feed Heater	18	157,680
737	Naphtha HDS Heater	76	665,760
738	Platformer Feed Heater	493	4,318,680
739	Isocracker 1st Stage Heater	33	289,080
740	Isocracker Splitter Reboiler	44	385,440
742	VCD 541 VAC Heater	36	315,360
743	VCD 542 VAC Heater	20	175,200
746	VCD 544 VAC Heater	71	621,960
744	ACD 543 Crude Heater	260	2,277,600
745	ACD 544 Crude Heater	260	2,277,600
165	Tank 93	-	-
166	Tank 94	-	-
126	Tank 95	-	-
127	Tank 96	-	-
137	Tank 152	-	-
138	Tank 153	-	-
140	Tank 155	-	-
142	Tank 157	-	-
300	Tank 158 (Source ID 193)	-	-
143	Tank 159	-	-
194	Tank 160	-	-
144	Tank 161	-	-
145	Tank 162	-	-
146	Tank 163	-	-
147	Tank 164	-	-
148	Tank 165	-	-
149	Tank 166	-	-
150	Tank 168	-	-
152	Tank 170	-	-
155	Tank 174	-	-
156	Tank 175	-	-
157	Tank 178	-	-
160	Tank 181	-	-
161	Tank 182	-	-
163	Tank 185	-	-
164	Tank 186	-	-

<sup>(a)</sup> Based on 195,000 BPD crude rate from 10 year plan.

<sup>(b)</sup> Emissions are based on pounds of coke burned in the catalyst regenerator instead of fuel. Please see table C-4 for more details.

**Table C-18**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Projected Actual Emissions from Boiler 9**

<b>Pollutant</b>	<b>Emission Factor</b>	<b>Emission Factor Units</b>	<b>Notes</b>	<b>Projected Future Actual Emissions<sup>(a),(b)</sup></b>	
				<b>lb/hr</b>	<b>tpy</b>
Filterable PM	7.00E-04	lb/MMBtu	2014 stack test data	0.16	0.70
Total PM <sub>10</sub>	5.50E-03	lb/MMBtu	2014 stack test data	1.25	5.48
Total PM <sub>2.5</sub>	4.90E-03	lb/MMBtu	2014 stack test data	1.11	4.88
SO <sub>2</sub>	1.00E-03	lb/MMBtu	CEM data and 2009 stack test	0.23	1.00
NO <sub>X</sub>	4.26E-03	lb/MMBtu	2014 CEMS data - annual average of hourly data	0.97	4.24
VOC	2.97E-04	lb/MMBtu	2014 stack test data	0.07	0.30
CO	1.29E-03	lb/MMBtu	2014 CEMS data - annual average of hourly data	0.29	1.29
Pb	5.00E-04	lb/MMSCF	AP-42 Chapter 1.4 Natural Gas Combustion Table 1.4-2	1.05E-04	4.62E-04
H <sub>2</sub> S	8.50E-05	lb/MMBtu	U.S. EPA's memo titled "Emission Estimation Protocol for Petroleum Refineries" from May 2011, Table 4-3.	0.02	0.08
TRS <sup>(c)</sup>	8.50E-05	lb/MMBtu	U.S. EPA's memo titled "Emission Estimation Protocol for Petroleum Refineries" from May 2011, Table 4-3.	0.02	0.08
CO <sub>2</sub>	120,000	lb/MMSCF	AP-42 Chapter 1.4 Natural Gas Combustion Table 1.4-2	25,302.14	110,823.39
N <sub>2</sub> O	2.2	lb/MMSCF	AP-42 Chapter 1.4 Natural Gas Combustion Table 1.4-2	0.46	2.03
CH <sub>4</sub>	2.3	lb/MMSCF	AP-42 Chapter 1.4 Natural Gas Combustion Table 1.4-2	0.48	2.12
Total GHG	N/A	N/A	Emissions are calculated as the sum of CO <sub>2</sub> , N <sub>2</sub> O, and CH <sub>4</sub> .	25,303.09	110,827.55
CO <sub>2</sub> e <sup>(d)</sup>	N/A	N/A	Emissions are calculated according to 40 CFR Part 98 Equation A-1.	25,452.50	111,481.96

<sup>(a)</sup> Monroe proportionally added the fuel needed to accommodate the additional steam demand based on fuel usages in 2013 and 2014 to the maximum baseline fuel usage of Boilers 9 and 10, as shown below. Fuel additions were based on a total additional steam demand of 5,800 lbs/hr for both the ULSG Construction and the Crude Oil Throughput project, 8,760 hours of operating per year, and an assumed heat input of 1,350 Btu to generate 1 lb of steam.

Baseline Years		Fuel Usage + Additional for Steam Demand (MMcf/yr)
2013	2014	1,847.06

<sup>(b)</sup> Projected future actual emissions were calculated assuming the following:

Parameter	Value	Units/Notes
Operating Hours	8,760	hr/yr
Conversion Factor 1	2,000	lb/ton
Fuel Gas Heating Value	1,078	MMBtu/MMscf

<sup>(c)</sup> Emission factor for TRS is assumed to be equal to the emission factor for H<sub>2</sub>S.

<sup>(d)</sup> CO<sub>2</sub>e is carbon dioxide equivalent, calculated according to 40 CFR Part 98 Equation A-1:

$$CO_2e = \sum_{i=1}^n GHG_i \times GWP_i$$

where GHGi = annual mass emissions of greenhouse gas i (short tons/year)

GWPi = global warming potential of greenhouse gas i from Table A-1 (below)

Pollutant	GWP (100 year)
CO <sub>2</sub>	1
N <sub>2</sub> O	298
CH <sub>4</sub>	25

**Table C-19**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Projected Actual Emissions from Boiler 10**

<b>Pollutant</b>	<b>Emission Factor</b>	<b>Emission Factor Units</b>	<b>Notes</b>	<b>Projected Future Actual Emissions<sup>(a),(b)</sup></b>	
				<b>lb/hr</b>	<b>tpy</b>
Filterable PM	4.00E-04	lb/MMBtu	2014 stack test data	0.09	0.38
Total PM <sub>10</sub>	3.10E-03	lb/MMBtu	2014 stack test data	0.67	2.96
Total PM <sub>2.5</sub>	3.00E-03	lb/MMBtu	2014 stack test data	0.65	2.86
SO <sub>2</sub>	3.00E-03	lb/MMBtu	CEM data and 2009 stack test	0.65	2.86
NO <sub>X</sub>	3.96E-03	lb/MMBtu	2014 CEMS data - annual average of hourly data	0.86	3.78
VOC	2.69E-04	lb/MMBtu	2014 stack test data	0.06	0.26
CO	4.97E-03	lb/MMBtu	2014 CEMS data - annual average of hourly data	1.08	4.74
Pb	5.00E-04	lb/MMSCF	AP-42 Chapter 1.4 Natural Gas Combustion Table 1.4-2	1.01E-04	4.42E-04
H <sub>2</sub> S	8.50E-05	lb/MMBtu	U.S. EPA's memo titled "Emission Estimation Protocol for Petroleum Refineries" from May 2011, Table 4-3.	0.02	0.08
TRS <sup>(c)</sup>	8.50E-05	lb/MMBtu	U.S. EPA's memo titled "Emission Estimation Protocol for Petroleum Refineries" from May 2011, Table 4-3.	0.02	0.08
CO <sub>2</sub>	120,000	lb/MMSCF	AP-42 Chapter 1.4 Natural Gas Combustion Table 1.4-2	24,229.19	106,123.87
N <sub>2</sub> O	2.2	lb/MMSCF	AP-42 Chapter 1.4 Natural Gas Combustion Table 1.4-2	0.44	1.95
CH <sub>4</sub>	2.3	lb/MMSCF	AP-42 Chapter 1.4 Natural Gas Combustion Table 1.4-2	0.46	2.03
Total GHG	N/A	N/A	Emissions are calculated as the sum of CO <sub>2</sub> , N <sub>2</sub> O, and CH <sub>4</sub> .	24,230.10	106,127.85
CO <sub>2</sub> e <sup>(d)</sup>	N/A	N/A	Emissions are calculated according to 40 CFR Part 98 Equation A-1.	24,373.18	106,754.51

<sup>(a)</sup> Monroe proportionally added the fuel needed to accommodate the additional steam demand based on fuel usages in 2013 and 2014 to the maximum baseline fuel usage of Boilers 9 and 10, as shown below. Fuel additions were based on a total additional steam demand of 5,800 lbs/hr for both the ULSG Construction and the Crude Oil Throughput project, 8,760 hours of operating per year, and an assumed heat input of 1,350 Btu to generate 1 lb of steam.

Baseline Years		Fuel Usage + Additional for Steam Demand (MMcf/yr)
2013	2014	1,768.73

<sup>(b)</sup> Projected future actual emissions were calculated assuming the following:

Parameter	Value	Units/Notes
Operating Hours	8,760	hr/yr
Conversion Factor 1	2,000	lb/ton
Fuel Gas Heating Value	1,078	MMBtu/MMscf

<sup>(c)</sup> Emission factor for TRS is assumed to be equal to the emission factor for H<sub>2</sub>S.

<sup>(d)</sup> CO<sub>2</sub>e is carbon dioxide equivalent, calculated according to 40 CFR Part 98 Equation A-1:

$$CO_2e = \sum_{i=1}^n GHG_i \times GWP_i$$

where GHGi = annual mass emissions of greenhouse gas i (short tons/year)

GWPi = global warming potential of greenhouse gas i from Table A-1 (below)

Pollutant	GWP (100 year)
CO <sub>2</sub>	1
N <sub>2</sub> O	298
CH <sub>4</sub>	25

**Table C-31**  
**Monroe Energy, LLC - Trainer, PA Facility**  
**Projected Future Actual Emissions**

Emission Unit	Emission Rate (tpy)								
	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	H <sub>2</sub> S	CO <sub>2</sub> e <sup>(*)</sup>
<b>ULSG Affected Sources</b>									
34	Boiler 9	0.70	5.48	4.88	1.00	4.24	0.30	1.29	0.08
35	Boiler 10	0.38	2.96	2.86	2.86	3.78	0.26	4.74	0.08
102	SRU	0.11	0.44	0.44	40.33	5.83	0.32	4.90	0.00
103	Main Flare	1.25	1.74	1.74	4.15	3.15	6.48	17.13	2.47
<b>Crude Throughput Project Affected Sources</b>									
101	FCCU Feed Heater	84.62	110.60	96.21	88.82	432.52	3.20	16.35	-
733	FCCU Feed Heater	0.18	0.72	0.72	0.78	3.02	0.52	7.93	8.56E-03
735	Kerosene/HCN HTU Feed Heater	0.06	0.25	0.25	0.28	4.51	0.18	2.81	3.09E-03
736	Diesel HTU Heater	0.11	0.62	0.62	0.67	13.84	0.39	0.18	4.749.00
741	D2/VGO Hydrotreater Feed Heater	0.15	0.59	0.59	0.61	7.71	0.42	6.48	6.70E-03
737	Naphtha HDS Heater	0.61	2.43	2.43	2.55	33.29	1.76	26.88	0.03
738	Platfromer Feed Heater	4.06	16.23	16.23	17.03	185.70	11.75	0.15	43.484.82
739	Isoocracker 1st Stage Heater	0.26	1.03	1.03	1.08	16.77	0.75	11.43	0.01
740	Isoocracker Splitter Reboiler	0.34	1.37	1.37	1.44	18.05	0.99	15.17	0.02
742	VCD 541 VAC Heater	0.27	1.06	1.06	1.16	20.50	0.77	11.76	0.01
743	VCD 542 VAC Heater	0.15	0.62	0.62	0.67	6.75	0.03	0.02	7.45E-03
746	VCD 544 VAC Heater	0.55	2.19	2.19	2.39	12.44	2.18	5.29	0.03
744	ACD 543 Crude Heater	2.01	8.02	8.02	8.77	45.55	5.81	88.66	0.10
745	ACD 544 Crude Heater	2.00	8.01	8.01	8.75	50.11	5.80	88.55	0.10
34	Boiler 9	0.70	5.48	4.88	1.00	4.24	0.30	1.29	0.08
35	Boiler 10	0.38	2.96	2.86	2.86	3.78	0.26	4.74	0.08
102	SRU	0.11	0.44	0.44	40.33	5.83	0.32	4.90	0.00
103	Main Flare	1.25	1.74	1.74	4.15	3.15	6.48	17.13	2.47
165	Tank 93	-	-	-	-	1.92	-	-	-
166	Tank 94	-	-	-	-	2.76	-	-	-
126	Tank 95	-	-	-	-	3.46	-	-	-
127	Tank 96	-	-	-	-	4.45	-	-	-
137	Tank 152	-	-	-	-	5.06	-	-	-
138	Tank 153	-	-	-	-	0.19	-	-	-
140	Tank 155	-	-	-	-	0.18	-	-	-
142	Tank 157	-	-	-	-	0.21	-	-	-
300	Tank 158 (Source ID 193)	-	-	-	-	13.15	-	-	-
143	Tank 159	-	-	-	-	3.97	-	-	-
194	Tank 160	-	-	-	-	0.22	-	-	-
144	Tank 161	-	-	-	-	6.04	-	-	-
145	Tank 162	-	-	-	-	3.25	-	-	-
146	Tank 163	-	-	-	-	4.25	-	-	-
147	Tank 164	-	-	-	-	3.79	-	-	-
148	Tank 165	-	-	-	-	8.26	-	-	-
149	Tank 166	-	-	-	-	3.55	-	-	-
150	Tank 168	-	-	-	-	2.89	-	-	-
152	Tank 170	-	-	-	-	6.13	-	-	-
155	Tank 174	-	-	-	-	12.01	-	-	-
156	Tank 175	-	-	-	-	7.43	-	-	-
157	Tank 178	-	-	-	-	3.23	-	-	-
160	Tank 181	-	-	-	-	8.75	-	-	-
161	Tank 182	-	-	-	-	20.53	-	-	-
163	Tank 185	-	-	-	-	11.26	-	-	-
164	Tank 186	-	-	-	-	5.47	-	-	-
N/A	New Feed Heaters	3.15	3.15	3.15	4.42	22.04	3.15	17.08	-
N/A	New Cooling Tower	0.16	0.16	0.16	-	-	6.02	-	-
N/A	Additional Fugitive Emissions	-	-	-	-	-	5.13	-	-
<b>Total Projected Future Actual Emissions</b>		<b>103.54</b>	<b>178.27</b>	<b>162.50</b>	<b>236.11</b>	<b>906.79</b>	<b>205.97</b>	<b>354.83</b>	<b>5.77</b>
<i><sup>(*)</sup> CO<sub>2</sub>e is carbon dioxide equivalent, calculated according to 40 CFR 98 Equation A-1.</i>									

<sup>(\*)</sup> CO<sub>2</sub>e =  $\sum_{i=1}^n GHG_i \times GWP_i$

where GHG<sub>i</sub> = annual mass emissions of greenhouse gas i (short tons/year)  
 GWP<sub>i</sub> = global warming potential of greenhouse gas i from the table below

Pollutant	GWP (100 year)
CO <sub>2</sub>	1
N <sub>2</sub> O	298
CH <sub>4</sub>	25

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source	Pollutant	Projected Actual Emissions (PAE)	Baseline Actual Emissions (BAE)	Emission Increases (PAE - BAE)	Emissions Which Could Have Been Accommodated (CHA)	Excludable Emissions (CHA - BAE)	Total Project Emission Increases (PAE - Excludable - BAE)
							tons/yr
<b>ULSG Affected Sources</b>							
34	Boiler 9	PM	0.70	0.53	0.17	-	-
		PM <sub>10</sub>	5.48	1.69	3.79	-	-
		PM <sub>2.5</sub>	4.88	1.51	3.37	-	-
		SO <sub>2</sub>	1.00	1.93	0.00	-	-
		NO <sub>x</sub>	4.24	4.14	0.10	-	-
		VOC	0.30	0.11	0.19	-	-
		CO	1.29	1.17	0.12	-	-
		Lead	4.62E-04	4.51E-04	1.07E-05	-	-
		Fluorides	-	0.00	-	-	-
		H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	-	0.03
		H <sub>2</sub> S	0.08	0.06	0.03	-	-
		TRS	0.08	0.06	0.03	-	-
		CO <sub>2</sub>	110,823.39	72,880.82	37,942.58	-	-
		N <sub>2</sub> O	2.03	0.14	1.89	-	-
		CH <sub>4</sub>	2.12	1.37	0.75	-	-
35	Boiler 10	PM	0.38	0.38	0.00	-	-
		PM <sub>10</sub>	2.96	1.06	1.89	-	-
		PM <sub>2.5</sub>	2.86	1.01	1.85	-	-
		SO <sub>2</sub>	2.86	1.91	0.95	-	-
		NO <sub>x</sub>	3.78	3.89	0.00	-	-
		VOC	0.26	0.10	0.16	-	-
		CO	4.74	8.72	0.00	-	-
		Lead	4.42E-04	4.32E-04	1.01E-05	-	-
		Fluorides	-	0.00	-	-	-
		H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	-	0.02
		H <sub>2</sub> S	0.08	0.06	0.02	-	-
		TRS	0.08	0.06	0.02	-	-
		CO <sub>2</sub>	106,123.87	83,481.92	22,641.95	-	-
		N <sub>2</sub> O	1.95	0.16	1.79	-	-
		CH <sub>4</sub>	2.03	1.57	0.46	-	-
102	SRU	PM	0.11	0.10	0.01	-	-
		PM <sub>10</sub>	0.44	0.38	0.07	-	-
		PM <sub>2.5</sub>	0.44	0.38	0.07	-	-
		SO <sub>2</sub>	40.33	19.27	21.06	-	-
		NO <sub>x</sub>	5.83	5.22	0.62	-	-
		VOC	0.32	0.24	0.08	-	-
		CO	4.90	3.56	1.34	-	-
		Lead	2.92E-05	2.04E-05	8.78E-06	-	-
		Fluorides	-	0.00	-	-	-
		H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	-	0.00
		H <sub>2</sub> S	0.00	0.00	0.00	-	-
		TRS	2.92E-05	-	-	-	-
		CO <sub>2</sub>	0.00	2,852.70	0.00	-	-
		N <sub>2</sub> O	0.00	0.06	0.00	-	-
		CH <sub>4</sub>	0.00	5.88E-03	0.00	-	-
103	Main Flare	PM	1.25	4.05	0.00	-	-
		PM <sub>10</sub>	1.74	5.04	0.00	-	-
		PM <sub>2.5</sub>	1.74	5.04	0.00	-	-
		SO <sub>2</sub>	4.15	10.04	0.00	-	-
		NO <sub>x</sub>	3.15	10.19	0.00	-	-
		VOC	6.48	33.12	0.00	-	-
		CO	17.13	58.11	0.00	-	-
		Lead	2.14E-04	1.14E-04	9.96E-05	-	-
		Fluorides	0.00	0.00	0.00	-	-
		H <sub>2</sub> SO <sub>4</sub>	0.00	0.00	0.00	-	-
		H <sub>2</sub> S	2.47	14.23	0.00	-	-
		TRS	-	-	-	-	-
		CO <sub>2</sub>	0.00	51,382.53	0.00	-	-
		N <sub>2</sub> O	0.00	0.96	0.00	-	-
		CH <sub>4</sub>	0.00	8.75	0.00	-	-

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source	Pollutant	Projected Actual Emissions (PAE)	Baseline Actual Emissions (BAE)	Emission Increases (PAE - BAE)	Emissions Which Could Have Been Accommodated (CHA)	Excludable Emissions (CHA - BAE)	Total Project Emission Increases (PAE - Excludable - BAE)	
tons/yr								
<b>Crude Throughput Project Affected Sources</b>								
34	25	PM PM <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub> VOC CO Lead Fluorides H <sub>2</sub> SO <sub>4</sub> H <sub>2</sub> S TRS CO <sub>2</sub> N <sub>2</sub> O CH <sub>4</sub>						
35	0	PM PM <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub> VOC CO Lead Fluorides H <sub>2</sub> SO <sub>4</sub> H <sub>2</sub> S TRS CO <sub>2</sub> N <sub>2</sub> O CH <sub>4</sub>						
102	SRU	PM PM <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub> VOC CO Lead Fluorides H <sub>2</sub> SO <sub>4</sub> H <sub>2</sub> S TRS CO <sub>2</sub> N <sub>2</sub> O CH <sub>4</sub>						
103	Main Flare	PM PM <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub> VOC CO Lead Fluorides H <sub>2</sub> SO <sub>4</sub> H <sub>2</sub> S TRS CO <sub>2</sub> N <sub>2</sub> O CH <sub>4</sub>						
101	FCC Unit	PM PM <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub> VOC CO Lead Fluorides H <sub>2</sub> SO <sub>4</sub> H <sub>2</sub> S TRS CO <sub>2</sub> N <sub>2</sub> O CH <sub>4</sub>	84.62 110.60 96.21 88.82 432.52 3.20 16.35 - - - 754,773.34 4.42 22.11	43.06 63.93 56.61 46.18 297.01 3.18 15.63 2.47E-04 0.00 0.00 - 499,375.51 2.93 14.67	41.56 46.66 39.60 42.64 135.51 0.02 0.71 - - - 255,397.83 1.50 7.44	93.30 140.78 120.81 96.67 454.41 3.26 35.45 4.18E-04 0.00 0.00 - 560,274.64 3.28 16.46	50.24 76.84 64.20 50.49 157.40 0.08 19.82 1.71E-04 0.00 0.00 - 60,899.13 0.36 1.79	0.00 0.00 0.00 0.00 0.00 0.00 0.00 - - - 194,498.70 1.14 5.65

Emissions increases are accounted for in the "ULSG sources" section above.

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source	Pollutant	Projected Actual	Baseline Actual	Emission	Emissions Which	Excludable	Total Project	
		Emissions (PAE)	Emissions (BAE)	Increases (PAE - BAE)	Could Have Been Accommodated (CHA)	Emissions (CHA - BAE)	Emission Increases (PAE - Excludable - BAE)	
tons/yr								
733	FCCU Feed Heater	PM	0.18	0.10	0.08	0.38	0.28	0.00
		PM <sub>10</sub>	0.72	0.42	0.30	1.52	1.10	0.00
		PM <sub>2.5</sub>	0.72	0.42	0.30	1.52	1.10	0.00
		SO <sub>2</sub>	0.78	0.44	0.34	1.66	1.22	0.00
		NO <sub>x</sub>	3.02	1.76	1.26	6.44	4.67	0.00
		VOC	0.52	0.30	0.22	1.10	0.80	0.00
		CO	7.93	0.93	7.00	11.29	10.36	0.00
		Lead	4.72E-05	3.73E-05	9.89E-06	9.99E-05	6.26E-05	0.00
		Fluorides	-	0.00	-	0.00	0.00	-
		H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	8.85E-03	0.00
		H <sub>2</sub> S	8.56E-03	0.01	0.00	0.02	0.01	0.00
		TRS	8.56E-03	0.01	0.00	0.02	-	-
		CO <sub>2</sub>	13,103.51	16,695.75	0.00	34,001.33	17,305.58	0.00
		N <sub>2</sub> O	0.13	0.17	0.00	0.35	0.18	0.00
		CH <sub>4</sub>	0.67	0.85	0.00	1.73	0.88	0.00
735	Kerosene/HCN HTU Feed Heater	PM	0.06	0.22	0.00	0.47	0.25	0.00
		PM <sub>10</sub>	0.25	0.36	0.00	0.50	0.15	0.00
		PM <sub>2.5</sub>	0.25	0.36	0.00	0.50	0.15	0.00
		SO <sub>2</sub>	0.28	0.39	0.00	0.55	0.16	0.00
		NO <sub>x</sub>	4.51	6.41	0.00	9.20	2.79	0.00
		VOC	0.18	0.26	0.00	0.36	0.11	0.00
		CO	2.81	3.23	0.00	5.23	2.00	0.00
		Lead	1.67E-05	1.82E-05	0.00	2.85E-05	1.03E-05	0.00
		Fluorides	-	0.00	-	0.00	0.00	-
		H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	1.00E-03	0.00
		H <sub>2</sub> S	3.09E-03	2.74E-03	3.54E-04	3.74E-03	1.59E-03	0.00
		TRS	3.09E-03	2.77E-03	3.22E-04	4.36E-03	2.351.42	0.00
		CO <sub>2</sub>	4,728.66	4,319.92	408.74	6,671.34	-	-
		N <sub>2</sub> O	0.05	0.04	4.16E-03	0.07	0.02	0.00
		CH <sub>4</sub>	0.24	0.22	0.02	0.34	0.12	0.00
736	Diesel HTU Heater	PM	0.11	0.24	0.00	0.63	0.39	0.00
		PM <sub>10</sub>	0.62	0.42	0.19	0.68	0.26	0.00
		PM <sub>2.5</sub>	0.62	0.42	0.19	0.68	0.26	0.00
		SO <sub>2</sub>	0.67	0.49	0.18	0.81	0.31	0.00
		NO <sub>x</sub>	13.84	10.39	3.45	16.45	6.07	0.00
		VOC	0.39	0.06	0.34	0.39	0.33	7.36E-03
		CO	0.18	3.49	0.00	10.87	7.38	0.00
		Lead	4.05E-05	3.35E-05	6.98E-06	6.47E-05	3.12E-05	0.00
		Fluorides	-	0.00	-	0.00	0.00	-
		H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	2.93E-03	0.00
		H <sub>2</sub> S	7.45E-03	9.06E-03	0.00	0.01	2.75E-03	0.00
		TRS	7.45E-03	9.24E-03	0.00	0.01	-	-
		CO <sub>2</sub>	11,394.36	13,802.45	0.00	18,354.99	4,552.54	0.00
		N <sub>2</sub> O	0.12	0.14	0.00	0.19	0.05	0.00
		CH <sub>4</sub>	0.58	0.70	0.00	0.93	0.23	0.00
741	D2/VGO Hydrotreater Feed Heater	PM	0.15	0.43	0.00	0.79	0.36	0.00
		PM <sub>10</sub>	0.59	0.33	0.26	1.14	0.81	0.00
		PM <sub>2.5</sub>	0.59	0.33	0.26	1.14	0.81	0.00
		SO <sub>2</sub>	0.61	0.64	0.00	1.20	0.56	0.00
		NO <sub>x</sub>	7.71	8.01	0.00	15.06	7.05	0.00
		VOC	0.42	0.44	0.00	0.83	0.39	0.00
		CO	6.48	7.44	0.00	15.41	7.97	0.00
		Lead	3.86E-05	4.78E-05	0.00	9.17E-05	4.39E-05	0.00
		Fluorides	-	0.00	-	0.00	0.00	-
		H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	4.27E-03	0.00
		H <sub>2</sub> S	6.70E-03	0.01	0.00	0.02	7.79E-03	0.00
		TRS	6.70E-03	0.01	0.00	0.02	-	-
		CO <sub>2</sub>	10,254.92	23,209.06	0.00	34,559.53	11,350.47	0.00
		N <sub>2</sub> O	0.10	0.24	0.00	0.35	0.12	0.00
		CH <sub>4</sub>	0.52	1.18	0.00	1.76	0.58	0.00

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source	Pollutant	Projected Actual Emissions (PAE)	Baseline Actual Emissions (BAE)	Emission Increases (PAE - BAE)	Emissions Which Could Have Been Accommodated (CHA)	Excludable Emissions (CHA - BAE)	Total Project Emission Increases (PAE - Excludable - BAE)
							tons/yr
737	PM	0.61	1.19	0.00	2.37	1.18	0.00
	PM <sub>10</sub>	2.43	1.87	0.56	2.37	0.50	0.06
	PM <sub>2.5</sub>	2.43	1.87	0.56	2.37	0.50	0.06
	SO <sub>2</sub>	2.55	1.96	0.59	2.49	0.53	0.06
	NO <sub>x</sub>	33.29	26.07	7.22	37.04	10.97	0.00
	VOC	1.76	1.35	0.41	1.72	0.36	0.04
	CO	26.88	20.86	6.01	26.25	5.38	0.63
	Lead	1.60E-04	1.22E-04	3.83E-05	1.56E-04	3.45E-05	3.75E-06
	Fluorides	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> S	0.03	0.02	6.14E-03	0.03	6.98E-03	0.00
	TRS	0.03	0.02	6.68E-03	0.03	7.52E-03	0.00
	CO <sub>2</sub>	43,298.56	33,037.72	10,260.84	44,576.75	11,539.03	0.00
	N <sub>2</sub> O	0.44	0.34	0.10	0.45	0.12	0.00
	CH <sub>4</sub>	2.20	1.68	0.52	2.27	0.59	0.00
	PM	4.06	8.45	0.00	15.12	6.67	0.00
	PM <sub>10</sub>	16.23	13.44	2.79	15.46	2.01	0.78
738	PM <sub>2.5</sub>	16.23	13.44	2.79	15.46	2.01	0.78
	SO <sub>2</sub>	17.03	14.10	2.92	16.21	2.11	0.81
	NO <sub>x</sub>	185.70	147.14	38.57	174.17	27.04	11.53
	VOC	11.75	9.73	2.02	11.19	1.46	0.56
	CO	0.15	1.57	0.00	7.11	5.54	0.00
	Lead	1.07E-03	9.42E-04	1.26E-04	1.10E-03	1.61E-04	0.00
	Fluorides	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> S	0.18	0.19	0.00	0.21	0.02	0.00
	TRS	0.18	0.19	0.00	0.21	0.02	0.00
	CO <sub>2</sub>	280,870.92	284,157.46	0.00	319,415.38	35,257.92	0.00
	N <sub>2</sub> O	2.86	2.89	0.00	3.25	0.36	0.00
	CH <sub>4</sub>	14.28	14.45	0.00	16.24	1.79	0.00
	PM	0.26	0.55	0.00	1.07	0.52	0.00
	PM <sub>10</sub>	1.03	0.96	0.07	1.39	0.43	0.00
739	PM <sub>2.5</sub>	1.03	0.96	0.07	1.39	0.43	0.00
	SO <sub>2</sub>	1.08	1.01	0.07	1.46	0.45	0.00
	NO <sub>x</sub>	16.77	15.65	1.12	21.75	6.10	0.00
	VOC	0.75	0.70	0.05	1.01	0.31	0.00
	CO	11.43	11.21	0.22	16.45	5.24	0.00
	Lead	6.80E-05	6.49E-05	3.08E-06	9.76E-05	3.27E-05	0.00
	Fluorides	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> S	0.01	9.24E-03	3.04E-03	0.02	5.95E-03	0.00
	TRS	0.01	9.38E-03	2.90E-03	0.02	5.81E-03	0.00
	CO <sub>2</sub>	18,800.69	14,711.55	4,089.14	23,249.17	8,537.61	0.00
	N <sub>2</sub> O	0.19	0.15	0.04	0.24	0.09	0.00
	CH <sub>4</sub>	0.96	0.75	0.21	1.18	0.43	0.00
	PM	0.34	0.69	0.00	1.50	0.81	0.00
	PM <sub>10</sub>	1.37	1.19	0.18	1.50	0.31	0.00
740	PM <sub>2.5</sub>	1.37	1.19	0.18	1.50	0.31	0.00
	SO <sub>2</sub>	1.44	1.25	0.19	1.58	0.32	0.00
	NO <sub>x</sub>	18.05	15.70	2.36	19.76	4.07	0.00
	VOC	0.99	0.86	0.13	1.09	0.22	0.00
	CO	15.17	13.38	1.78	17.58	4.19	0.00
	Lead	9.03E-05	7.83E-05	1.20E-05	1.05E-04	2.64E-05	0.00
	Fluorides	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> S	0.02	0.01	5.29E-03	0.02	4.02E-03	1.27E-03
	TRS	0.02	0.01	4.70E-03	0.02	3.90E-03	8.04E-04
	CO <sub>2</sub>	25,067.59	18,382.52	6,685.07	23,836.53	5,454.01	1,231.06
	N <sub>2</sub> O	0.25	0.19	0.07	0.24	0.06	0.01
	CH <sub>4</sub>	1.27	0.93	0.34	1.21	0.28	0.06
	PM	0.27	0.18	0.09	0.29	0.12	0.00
	PM <sub>10</sub>	1.06	0.71	0.36	1.17	0.46	0.00
742	PM <sub>2.5</sub>	1.06	0.71	0.36	1.17	0.46	0.00
	SO <sub>2</sub>	1.16	0.77	0.39	1.28	0.50	0.00
	NO <sub>x</sub>	20.50	13.38	7.12	21.87	8.49	0.00
	VOC	0.77	0.51	0.26	0.85	0.33	0.00
	CO	11.76	7.34	4.41	11.34	4.00	0.41
	Lead	7.00E-05	4.31E-05	2.69E-05	6.75E-05	2.45E-05	2.46E-06
	Fluorides	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> S	0.01	9.43E-03	3.97E-03	0.01	2.88E-03	1.10E-03
	TRS	0.01	9.09E-03	4.31E-03	0.01	2.57E-03	1.74E-03
	CO <sub>2</sub>	20,509.84	13,793.59	6,716.25	17,844.39	4,050.79	2,665.46
	N <sub>2</sub> O	0.21	0.14	0.07	0.18	0.04	0.03
	CH <sub>4</sub>	1.04	0.70	0.34	0.91	0.21	0.14

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source	Pollutant	Projected Actual Emissions (PAE)	Baseline Actual Emissions (BAE)	Emission Increases (PAE - BAE)	Emissions Which Could Have Been Accommodated (CHA)	Excludable Emissions (CHA - BAE)	Total Project Emission Increases (PAE - Excludable - BAE)
							tons/yr
743	PM	0.15	0.44	0.00	1.32	0.88	0.00
	PM <sub>10</sub>	0.62	0.78	0.00	1.32	0.53	0.00
	PM <sub>2.5</sub>	0.62	0.78	0.00	1.32	0.53	0.00
	SO <sub>2</sub>	0.67	0.44	0.24	0.76	0.32	0.00
	NO <sub>x</sub>	6.75	4.48	2.27	7.52	3.04	0.00
	VOC	0.03	0.02	9.65E-03	0.03	0.01	0.00
	CO	0.02	0.01	8.67E-03	0.02	0.01	0.00
	Lead	4.06E-05	2.38E-05	1.68E-05	4.60E-05	2.22E-05	0.00
	Fluorides	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> S	7.45E-03	0.01	0.00	0.01	2.44E-03	0.00
	TRS	7.45E-03	0.01	0.00	0.01	1.78E-03	0.00
	CO <sub>2</sub>	11,394.36	17,771.31	0.00	20,631.05	2,859.74	0.00
	N <sub>2</sub> O	0.12	0.18	0.00	0.21	0.03	0.00
	CH <sub>4</sub>	0.58	0.90	0.00	1.05	0.15	0.00
	PM	0.55	1.35	0.00	3.20	1.85	0.00
	PM <sub>10</sub>	2.19	2.88	0.00	3.36	0.48	0.00
746	PM <sub>2.5</sub>	2.19	2.88	0.00	3.36	0.48	0.00
	SO <sub>2</sub>	2.39	2.37	0.02	2.88	0.52	0.00
	NO <sub>x</sub>	12.44	12.53	0.00	14.63	2.10	0.00
	VOC	2.18	2.19	0.00	2.56	0.37	0.00
	CO	5.29	1.34	3.95	5.41	4.07	0.00
	Lead	1.44E-04	1.40E-04	4.35E-06	1.74E-04	3.41E-05	0.00
	Fluorides	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> S	0.03	0.02	2.82E-03	0.03	6.33E-03	0.00
	TRS	0.03	0.02	3.19E-03	0.03	6.71E-03	0.00
	CO <sub>2</sub>	40,449.97	35,464.65	4,985.32	45,828.20	10,363.55	0.00
	N <sub>2</sub> O	0.41	0.36	0.05	0.47	0.11	0.00
	CH <sub>4</sub>	2.06	1.80	0.25	2.33	0.53	0.00
	PM	2.01	4.32	0.00	8.66	4.35	0.00
	PM <sub>10</sub>	8.02	7.22	0.80	8.76	1.54	0.00
744	PM <sub>2.5</sub>	8.02	7.22	0.80	8.76	1.54	0.00
	SO <sub>2</sub>	8.77	7.89	0.87	9.57	1.68	0.00
	NO <sub>x</sub>	45.55	28.30	17.25	49.71	21.41	0.00
	VOC	5.81	5.23	0.58	6.34	1.11	0.00
	CO	88.66	81.32	7.34	96.84	15.52	0.00
	Lead	5.28E-04	4.82E-04	4.59E-05	5.76E-04	9.45E-05	0.00
	Fluorides	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> S	0.10	0.09	3.83E-03	0.11	0.01	0.00
	TRS	0.10	0.09	3.21E-03	0.11	0.01	0.00
	CO <sub>2</sub>	148,126.65	143,860.54	4,266.12	166,202.49	22,341.96	0.00
	N <sub>2</sub> O	1.51	1.46	0.04	1.69	0.23	0.00
	CH <sub>4</sub>	7.53	7.31	0.22	8.45	1.14	0.00
	PM	2.00	4.68	0.00	9.23	4.55	0.00
745	PM <sub>10</sub>	8.01	7.59	0.43	9.23	1.64	0.00
	PM <sub>2.5</sub>	8.01	7.59	0.43	9.23	1.64	0.00
	SO <sub>2</sub>	8.75	8.29	0.47	10.08	1.80	0.00
	NO <sub>x</sub>	50.11	32.82	17.28	56.20	23.37	0.00
	VOC	5.80	5.49	0.31	6.68	1.19	0.00
	CO	88.55	83.63	4.93	102.01	18.38	0.00
	Lead	5.27E-04	4.91E-04	3.59E-05	6.07E-04	1.16E-04	0.00
	Fluorides	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> SO <sub>4</sub>	-	0.00	-	0.00	0.00	-
	H <sub>2</sub> S	0.10	0.09	3.40E-03	0.10	9.51E-03	0.00
	TRS	0.10	0.09	1.93E-03	0.10	8.04E-03	0.00
	CO <sub>2</sub>	148,126.65	145,398.35	2,728.31	157,482.30	12,083.95	0.00
	N <sub>2</sub> O	1.51	1.48	0.03	1.60	0.12	0.00
	CH <sub>4</sub>	7.53	7.39	0.14	8.01	0.61	0.00
	PM	-	-	-	-	-	-
165	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	1.92	2.46	0.00	2.03	-4.30E-01	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source	Pollutant	Projected Actual Emissions (PAE)	Baseline Actual Emissions (BAE)	Emission Increases (PAE - BAE)	Emissions Which Could Have Been Accommodated (CHA)	Excludable Emissions (CHA - BAE)	Total Project Emission Increases (PAE - Excludable - BAE)
		tons/yr					
166	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	2.76	1.61	1.15	2.87	1.26	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
126	VOC	3.46	2.13	1.33	3.54	1.42	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	4.45	3.27	1.19	4.61	1.34	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
127	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	4.45	3.27	1.19	4.61	1.34	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
137	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	5.06	1.38	3.68	0.23	-1.15E+00	4.83
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
138	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	0.19	0.15	0.03	0.21	0.06	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source	Pollutant	Projected Actual Emissions (PAE)	Baseline Actual Emissions (BAE)	Emission Increases (PAE - BAE)	Emissions Which Could Have Been Accommodated (CHA)	Excludable Emissions (CHA - BAE)	Total Project Emission Increases (PAE - Excludable - BAE)
							tons/yr
140	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	0.18	0.13	0.05	0.22	0.09	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
142	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	0.21	0.15	0.06	0.24	0.09	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
300	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	13.15	3.50	9.66	28.01	24.51	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
143	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	3.97	3.32	0.65	4.06	0.74	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
194	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	0.22	4.86	0.00	0.26	-4.61E+00	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source	Pollutant	Projected Actual Emissions (PAE)	Baseline Actual Emissions (BAE)	Emission Increases (PAE - BAE)	Emissions Which Could Have Been Accommodated (CHA)	Excludable Emissions (CHA - BAE)	Total Project Emission Increases (PAE - Excludable - BAE)
		tons/yr					
144	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	6.04	2.70	3.34	6.21	3.51	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
145	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	3.25	0.87	2.39	6.36	5.49	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
146	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	4.25	1.60	2.64	4.57	2.97	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
147	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	3.79	2.53	1.26	7.79	5.26	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
148	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	8.26	3.09	5.17	20.33	17.24	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source		Pollutant	Projected Actual Emissions (PAE)	Baseline Actual Emissions (BAE)	Emission Increases (PAE - BAE)	Emissions Which Could Have Been Accommodated (CHA)	Excludable Emissions (CHA - BAE)	Total Project Emission Increases (PAE - Excludable - BAE)
								tons/yr
149	Tank 166	PM	-	-	-	-	-	-
		PM <sub>10</sub>	-	-	-	-	-	-
		PM <sub>2.5</sub>	-	-	-	-	-	-
		SO <sub>2</sub>	-	-	-	-	-	-
		NO <sub>x</sub>	-	-	-	-	-	-
		VOC	3.55	2.16	1.40	4.91	2.75	0.00
		CO	-	-	-	-	-	-
		Lead	-	-	-	-	-	-
		Fluorides	-	-	-	-	-	-
		H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
		H <sub>2</sub> S	-	-	-	-	-	-
		TRS	-	-	-	-	-	-
		CO <sub>2</sub>	-	-	-	-	-	-
		N <sub>2</sub> O	-	-	-	-	-	-
		CH <sub>4</sub>	-	-	-	-	-	-
		PM	-	-	-	-	-	-
		PM <sub>10</sub>	-	-	-	-	-	-
		PM <sub>2.5</sub>	-	-	-	-	-	-
150	Tank 168	SO <sub>2</sub>	-	-	-	-	-	-
		NO <sub>x</sub>	-	-	-	-	-	-
		VOC	2.89	1.53	1.36	0.24	-1.29E+00	2.65
		CO	-	-	-	-	-	-
		Lead	-	-	-	-	-	-
		Fluorides	-	-	-	-	-	-
		H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
		H <sub>2</sub> S	-	-	-	-	-	-
		TRS	-	-	-	-	-	-
		CO <sub>2</sub>	-	-	-	-	-	-
		N <sub>2</sub> O	-	-	-	-	-	-
		CH <sub>4</sub>	-	-	-	-	-	-
		PM	-	-	-	-	-	-
		PM <sub>10</sub>	-	-	-	-	-	-
		PM <sub>2.5</sub>	-	-	-	-	-	-
152	Tank 170	SO <sub>2</sub>	-	-	-	-	-	-
		NO <sub>x</sub>	-	-	-	-	-	-
		VOC	6.13	3.02	3.11	6.16	3.15	0.00
		CO	-	-	-	-	-	-
		Lead	-	-	-	-	-	-
		Fluorides	-	-	-	-	-	-
		H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
		H <sub>2</sub> S	-	-	-	-	-	-
		TRS	-	-	-	-	-	-
		CO <sub>2</sub>	-	-	-	-	-	-
		N <sub>2</sub> O	-	-	-	-	-	-
		CH <sub>4</sub>	-	-	-	-	-	-
		PM	-	-	-	-	-	-
		PM <sub>10</sub>	-	-	-	-	-	-
		PM <sub>2.5</sub>	-	-	-	-	-	-
155	Tank 174	SO <sub>2</sub>	-	-	-	-	-	-
		NO <sub>x</sub>	-	-	-	-	-	-
		VOC	12.01	4.09	7.92	13.79	9.70	0.00
		CO	-	-	-	-	-	-
		Lead	-	-	-	-	-	-
		Fluorides	-	-	-	-	-	-
		H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
		H <sub>2</sub> S	-	-	-	-	-	-
		TRS	-	-	-	-	-	-
		CO <sub>2</sub>	-	-	-	-	-	-
		N <sub>2</sub> O	-	-	-	-	-	-
		CH <sub>4</sub>	-	-	-	-	-	-
		PM	-	-	-	-	-	-
		PM <sub>10</sub>	-	-	-	-	-	-
		PM <sub>2.5</sub>	-	-	-	-	-	-
156	Tank 175	NO <sub>x</sub>	-	-	-	-	-	-
		VOC	7.43	5.35	2.07	12.61	7.25	0.00
		CO	-	-	-	-	-	-
		Lead	-	-	-	-	-	-
		Fluorides	-	-	-	-	-	-
		H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
		H <sub>2</sub> S	-	-	-	-	-	-
		TRS	-	-	-	-	-	-
		CO <sub>2</sub>	-	-	-	-	-	-
		N <sub>2</sub> O	-	-	-	-	-	-
		CH <sub>4</sub>	-	-	-	-	-	-
		PM	-	-	-	-	-	-
		PM <sub>10</sub>	-	-	-	-	-	-
		PM <sub>2.5</sub>	-	-	-	-	-	-

**Table C-33**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Project Emission Increases Summary**

Source	Pollutant	Projected Actual Emissions (PAE)	Baseline Actual Emissions (BAE)	Emission Increases (PAE - BAE)	Emissions Which Could Have Been Accommodated (CHA)	Excludable Emissions (CHA - BAE)	Total Project Emission Increases (PAE - Excludable - BAE)
		tons/yr					
157	PM	-	-	-	-	-	-
	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	3.23	4.53	0.00	5.85	1.32	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
160	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	8.75	3.03	5.72	22.24	19.21	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
161	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	20.53	6.52	14.01	39.43	32.91	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
163	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	11.26	7.02	4.23	11.81	4.78	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-
	PM	-	-	-	-	-	-
164	PM <sub>10</sub>	-	-	-	-	-	-
	PM <sub>2.5</sub>	-	-	-	-	-	-
	SO <sub>2</sub>	-	-	-	-	-	-
	NO <sub>x</sub>	-	-	-	-	-	-
	VOC	5.47	4.75	0.72	6.60	1.85	0.00
	CO	-	-	-	-	-	-
	Lead	-	-	-	-	-	-
	Fluorides	-	-	-	-	-	-
	H <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-
	H <sub>2</sub> S	-	-	-	-	-	-
	TRS	-	-	-	-	-	-
	CO <sub>2</sub>	-	-	-	-	-	-
	N <sub>2</sub> O	-	-	-	-	-	-
	CH <sub>4</sub>	-	-	-	-	-	-

**Table C-34**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**PSD Applicability Assessment Summary**

Emission Unit	Project Related Emissions Increase (tpy)											
	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	Lead	H <sub>2</sub> S	TRS	CO <sub>2</sub> e <sup>(a),(b)</sup>	
<b>ULSG Affected and New Sources</b>												
34	Boiler 9	0.17	3.79	3.37	0.00	0.10	0.19	0.12	1.07E-05	0.03	0.03	37,947.87
35	Boiler 10	0.00	1.89	1.85	0.95	0.00	0.16	0.00	1.01E-05	0.02	0.02	22,646.45
102	SRU	0.01	0.07	0.07	21.06	0.62	0.08	1.34	8.78E-06	0.00	-	0.00
103	Main Flare	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.96E-05	0.00	-	0.00
N/A	New Feed Heaters	3.15	3.15	3.15	4.42	22.04	3.15	17.08	2.66E-04	-	-	81,935.43
N/A	New Cooling Tower	0.16	0.16	0.16	-	-	6.02	-	-	-	-	-
N/A	Additional Fugitive Emissions	-	-	-	-	-	5.13	-	-	-	-	-
<b>Project Emissions Increases</b>	<b>3.49</b>	<b>9.05</b>	<b>8.60</b>	<b>26.43</b>	<b>22.76</b>	<b>14.73</b>	<b>18.53</b>	<b>3.96E-04</b>	<b>0.04</b>	<b>0.04</b>	<b>142,529.75</b>	
<b>Crude Throughput Project Affected Sources</b>												
101	FCCU Unit	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	194,979.46	
733	FCCU Feed Heater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
735	Kerosene/HCN HTU Feed Heater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
736	Diesel HTU Heater	0.00	0.00	0.00	0.00	0.00	7.36E-03	0.00	0.00	0.00	0.00	
741	D2/VGO Hydrotreater Feed Heater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
737	Naphtha HDS Heater	0.00	0.06	0.06	0.06	0.00	0.04	0.63	3.75E-06	0.00	0.00	
738	Platformer Feed Heater	0.00	0.78	0.78	0.81	11.53	0.56	0.00	0.00	0.00	0.00	
739	Isocracker 1st Stage Heater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27E-03	8.04E-04	1,236.35	
740	Isocracker Splitter Reboiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
742	VCD 541 VAC Heater	0.00	0.00	0.00	0.00	0.00	0.00	0.41	2.46E-06	1.10E-03	1.74E-03	
743	VCD 542 VAC Heater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
746	VCD 544 VAC Heater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
744	ACD 543 Crude Heater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
745	ACD 544 Crude Heater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
165	Tank 93	-	-	-	-	-	0.00	-	-	-	-	
166	Tank 94	-	-	-	-	-	0.00	-	-	-	-	
126	Tank 95	-	-	-	-	-	0.00	-	-	-	-	
127	Tank 96	-	-	-	-	-	0.00	-	-	-	-	
137	Tank 152	-	-	-	-	-	4.83	-	-	-	-	
138	Tank 153	-	-	-	-	-	0.00	-	-	-	-	
140	Tank 155	-	-	-	-	-	0.00	-	-	-	-	
142	Tank 157	-	-	-	-	-	0.00	-	-	-	-	
300	Tank 158 (Source ID 193)	-	-	-	-	-	0.00	-	-	-	-	
143	Tank 159	-	-	-	-	-	0.00	-	-	-	-	
194	Tank 160	-	-	-	-	-	0.00	-	-	-	-	
144	Tank 161	-	-	-	-	-	0.00	-	-	-	-	
145	Tank 162	-	-	-	-	-	0.00	-	-	-	-	
146	Tank 163	-	-	-	-	-	0.00	-	-	-	-	
147	Tank 164	-	-	-	-	-	0.00	-	-	-	-	
148	Tank 165	-	-	-	-	-	0.00	-	-	-	-	
149	Tank 166	-	-	-	-	-	0.00	-	-	-	-	
150	Tank 168	-	-	-	-	-	2.65	-	-	-	-	
152	Tank 170	-	-	-	-	-	0.00	-	-	-	-	
155	Tank 174	-	-	-	-	-	0.00	-	-	-	-	
156	Tank 175	-	-	-	-	-	0.00	-	-	-	-	
157	Tank 178	-	-	-	-	-	0.00	-	-	-	-	
160	Tank 181	-	-	-	-	-	0.00	-	-	-	-	
161	Tank 182	-	-	-	-	-	0.00	-	-	-	-	
163	Tank 185	-	-	-	-	-	0.00	-	-	-	-	
164	Tank 186	-	-	-	-	-	0.00	-	-	-	-	
<b>Project Emissions Increases</b>	<b>0.00</b>	<b>0.83</b>	<b>0.83</b>	<b>0.87</b>	<b>11.53</b>	<b>8.08</b>	<b>1.04</b>	<b>6.21E-06</b>	<b>2.36E-03</b>	<b>2.55E-03</b>	<b>198,892.74</b>	
<b>Total Project Emissions Increases</b>	<b>3.49</b>	<b>9.89</b>	<b>9.43</b>	<b>27.31</b>	<b>34.29</b>	<b>22.81</b>	<b>19.58</b>	<b>4.02E-04</b>	<b>0.05</b>	<b>0.05</b>	<b>341,422.48</b>	
<b>PSD Significance Threshold</b>	<b>25</b>	<b>15</b>	<b>10</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>100</b>	<b>0.6</b>	<b>10</b>	<b>10</b>	<b>75,000</b>	
<b>PSD Significant?</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	

<sup>(a)</sup> CO<sub>2</sub>e is carbon dioxide equivalent, calculated according to 40 CFR 98 Equation A-1:

$$CO_2e = \sum_{i=1}^n GHG_i \times GWP_i$$

where GHG<sub>i</sub> = annual mass emissions of greenhouse gas i (short tons/year)

GWP<sub>i</sub> = global warming potential of greenhouse gas i from the table below

Pollutant	GWP (100 year)
CO <sub>2</sub>	1
N <sub>2</sub> O	298
CH <sub>4</sub>	25

<sup>(b)</sup> A June 23, 2014 decision by the U.S. Supreme Court, in *Utility Air Regulatory Group v. EPA*, rules that PSD for greenhouse gas (GHG) emissions need only be considered when permitting already triggers PSD permitting for one of the convention PSD pollutants.

**Table C-35**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**NNSR Applicability Assessment Summary**

Emission Unit	Project Related Emissions Increase (tpy)				
	PM <sub>2.5</sub> NNSR			Ozone NNSR	
	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	NO <sub>x</sub>	VOC
<b>ULSG Affected Sources and New Sources</b>					
34	Boiler 9	3.37	0.00	0.10	0.19
35	Boiler 10	1.85	0.95	0.00	0.16
102	SRU	0.07	21.06	0.62	0.08
103	Main Flare	0.00	0.00	0.00	0.00
N/A	New Feed Heaters	3.15	4.42	22.04	3.15
N/A	New Cooling Tower	0.16	-	-	6.02
N/A	Additional Fugitive Emissions	-	-	-	5.13
<i>Project Emissions Increases</i>		8.60	26.43	22.76	14.73
<b>Crude Throughput Project Affected Sources</b>					
101	FCC Unit	0.00	0.00	0.00	0.00
733	FCCU Feed Heater	0.00	0.00	0.00	0.00
735	Kerosene/HCN HTU Feed Heater	0.00	0.00	0.00	0.00
736	Diesel HTU Heater	0.00	0.00	0.00	0.01
741	D2/VGO Hydrotreater Feed Heater	0.00	0.00	0.00	0.00
737	Naphtha HDS Heater	0.06	0.06	0.00	0.04
738	Platformer Feed Heater	0.78	0.81	11.53	11.53
739	Isocracker 1st Stage Heater	0.00	0.00	0.00	0.00
740	Isocracker Splitter Reboiler	0.00	0.00	0.00	0.00
742	VCD 541 VAC Heater	0.00	0.00	0.00	0.00
743	VCD 542 VAC Heater	0.00	0.00	0.00	0.00
746	VCD 544 VAC Heater	0.00	0.00	0.00	0.00
744	ACD 543 Crude Heater	0.00	0.00	0.00	0.00
745	ACD 544 Crude Heater	0.00	0.00	0.00	0.00
165	Tank 93	-	-	-	0.00
166	Tank 94	-	-	-	0.00
126	Tank 95	-	-	-	0.00
127	Tank 96	-	-	-	0.00
137	Tank 152	-	-	-	4.83
138	Tank 153	-	-	-	0.00
140	Tank 155	-	-	-	0.00
142	Tank 157	-	-	-	0.00
300	Tank 158 (Source ID 193)	-	-	-	0.00
143	Tank 159	-	-	-	0.00
194	Tank 160	-	-	-	0.00
144	Tank 161	-	-	-	0.00
145	Tank 162	-	-	-	0.00
146	Tank 163	-	-	-	0.00
147	Tank 164	-	-	-	0.00
148	Tank 165	-	-	-	0.00
149	Tank 166	-	-	-	0.00
150	Tank 168	-	-	-	2.65
152	Tank 170	-	-	-	0.00
155	Tank 174	-	-	-	0.00
156	Tank 175	-	-	-	0.00
157	Tank 178	-	-	-	0.00
160	Tank 181	-	-	-	0.00
161	Tank 182	-	-	-	0.00
163	Tank 185	-	-	-	0.00
164	Tank 186	-	-	-	0.00
<i>Project Emissions Increases</i>		0.83	0.87	11.53	11.53
<i>Total Project Emissions Increases</i>		9.43	27.31	34.29	34.29
<i>NNSR Significance Threshold</i>		10	40	40	25
<i>NNSR Significant?</i>		No	No	No	No

**Table C-36**  
**Monroe Energy, LLC - Trainer, PA Refinery**  
**Contemporaneous Emission Increases/Decreases**

Date <sup>(a)</sup>	Plan Approval/ RFD	Description	Note	Emission Increase/Decrease	
				NO <sub>x</sub>	VOC
				(tpy)	
10/03/2006	23-0003I	Two New Boilers		23.70	2.60
05/04/2007	23-0003J	Clean Fuel Project	(b)	39.00	0.00
10/19/2007	23-0003K	Modification to PA 23-0003G		21.89	0.00
10/23/2008	23-0003M	Cooling Tower		0.00	0.74
12/08/2008	23-0003N	FCCU Feed Heater Modification		0.00	(1.10)
02/09/2009	23-0003O	ReVAP	(c)		
04/10/2009	23-0003P	2010 Turnaround		1.59	0.26
09/28/2009	23-0003Q	Boiler MACT Phase II Application		0.00	0.00
12/04/2009	RFD	Light Components Loading		0.07	0.14
12/23/2009	23-0003R	Aromatic Saturation Unit Project	(c)		
10/01/2010	23-0003S	Flare Gas Recovery Project		0.00	3.58
10/01/2010	23-0003T	Amended Alky ReVAP Project	(c)		
11/09/2011	23-0003U	Two New Boilers (Replace Boiler 8)(withdrawn)			
04/12/2012	23-0003V	Diesel Heater Project	(c)		
08/09/2012	RFD	Main Flare - Turnaround		0.00	0.09
01/10/2013	RFD #3418	Propane Loading into Trucks		0.00	0.00
04/04/2013	RFD #3561	Peabody Heater Modifications		0.00	0.00
04/23/2013	RFD #3596	Max Jet		0.00	0.21
05/17/2013	23-0003W	D2 Project	(d)	0.00	3.44
03/13/2014	23-0003X	400 kW Emergency Generator	(e)	1.19	0.01
10/14/2014	23-0003Y	Proposed Boiler 13 (Replace Boiler 8)		11.70	1.98
Total Contemporaneous Emission Increases with Proposed Boiler 13				117.14	0.00
Total Contemporaneous Emission Reduction Credits Required			(f)	152.28	0.00
Total Emission Reduction Credits Previously Provided with PA 23-0003X			(g)	(146.20)	N/A
Net Emission Reduction Credits Required/Provided with PA 23-0003Y			(h)	6.08	0.00
TBD	23-0003Z	Proposed Cooling Tower Project	(i)	1.44	67.38
TBD	TBD	Proposed Flare PAA		1.60	0.09
TBD	TBD	Proposed ULSG PAA		34.29	22.81
				5-year Aggregation	37.33
				10-year Aggregation	37.33
				Significance Level	25
				Total Emission Reduction Credits Required <sup>(j)</sup>	49
					N/A

Notes:

(a) Based on net emission increases occurring over a 10-year period.

(b) This application modified an existing Plan Approval No. 23-0003E.

(c) Application/Plan Approval was withdrawn.

(d) Project triggered NNSR for VOC, 40 tons of VOC ERCs were purchased, cumulative contemporaneous emissions increase reset back to zero.

(e) Project triggered NNSR for NO<sub>x</sub>, 147.6 tons of NO<sub>x</sub> ERCs were purchased, cumulative contemporaneous emissions increase reset back to zero with an additional 1.4 tons available for future use.

(f) At an offset ratio of 1.3:1 per 25 Pa. Code § 127.210.

(g) Application/Plan Approval 23-0003U was withdrawn and desired back-up capacity now being replaced with proposed Boiler 13. Aggregate NO<sub>x</sub> ERCs required is reduced accordingly for those already provided under PA 23-0003X, per conversations with Virendra Trivedi (PADEP) on July 10, 2014.

(h) Project triggered NNSR for NO<sub>x</sub>, 6.08 tons of NO<sub>x</sub> ERCs were purchased, cumulative contemporaneous emission increase reset back to zero.

(i) Project triggered NNSR for VOC, 69.39 tons of VOC ERCs were purchased, cumulative contemporaneous emission increase reset back to zero.